

Environmental Consultant Company

PREPARED FOR:

INTERMOUNTAIN POWER COMPANY

DELTA, UTAH

SEPTEMBER 25, 1991

TLN 9128

IP12_006578

Environmental Consultant Company
dedicated to filtration science...

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PURCHASING

September 25, 1991
TLN 9128
Page 1

R E P O R T

INTERMOUNTAIN POWER SERVICE CORPORATION

REFERENCE: TLN 7774 OF MARCH 16, 1990

Twelve used filter bags were submitted for testing and evaluation.

These bags are the annual sampling for performance evaluations.

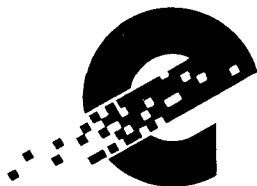
Unit 2 Compartment B-2 specimens are involved in sonic horn evaluations and one sample is before horn firing with the added sample after sonic horn firing.

The bags were labeled as follows:

<u>UNIT</u>	<u>COMPARTMENT</u>	<u>BAG</u>
2	B-2	J-11 AFTER HORN
2	B-2	M-13 BEFORE HORN
2	B-4	O-20
2	B-4	D-18
2	C-06	I-12
2	A-2	G-1
2	A-101	E-1
1	B-2	R-16
1	A-7	J-20
1	B-10	O-20
1	A-1	G-1
1	C-06	C-12

All bags were sampled from the G.E.E.S.I. reverse air cleaning baghouse collecting fly ash particulate.

Attached are the results of the testing data.



IP12_006579

UNIT 2 (SONIC TRIAL):

Bag specimen 2-B-2-M-13 (before sonic) exhibited low as received flow capacity throughput characteristics.

This bag (M-13) generated similar flow acceptance data to the Unit 2 data in TLN 7774 of March 16, 1990. The retained filter cake on M-13 exhibited moisture induced dust agglomerations and accounts for one factor in reduced capacity. Photo A is a view of the collection surface on M-13 revealing these surface nodulas with flow acceptances restricted to the voids between the nodulas.

In contrast, Bag 2-B-2-J-11 (after sonic) did demonstrate an elevated flow throughput capacity level compared to M-13. Examination of the J-11 collection surface did reveal some degree of nodule discharge however, substantial levels of loose residual dust normally embedded in the voids of the texturized yarn structure did discharge. Photo B is a view of these retained nodulas after sonic impact.

Photo C is a view of M-13 texturized yarns (as received) showing high embedded fine particles within the voids and further contributes to low throughput capacity.

Bag J-11 yielded lower embedded fine particulate no doubt the result of the sonic power impact (Photo D).

It is apparent that the sonic power is contributing to higher loose residual dust release however generates minor agglomerate release. The net effect is higher throughput. The agglomerates will not release under the cleaning action due to fiber encapsulation. Photo E is a view of the agglomerate structure encapsulating the strong fiberglass fibers and is preventing release.

Again, the sonic system is influencing throughput as a direct result of improved loose dust discharge characteristics.

The nodulas as the result of the bonding forces of predominately hygroscopic calcium sulphate salt resulting from the reaction between calcium oxide ash particulate and sulfur oxide gases.

In contrast with available moisture, the salts will act as a bonding agent forming the enlarged nodula.

The sulphates are at a 4.59% by weight on Bag M-13 and 4.38% by weight on Bag J-11 indicating the low nodula release levels being experienced.

UNIT 2:

The remaining Unit 2 bags all yielded generally low as received flow throughput acceptances in profile resulting from agglomerates (Photo F).

It was noted that the top areas are significantly closer to the corresponding bag averages in contrast to TLN 7774 where lower top flows were experienced compared to the corresponding bag averages. It is apparent that the accumulated fines common to the top area have discharged to some extent and/or agglomerated allowing the discharge.

All seven bags from Unit 2 exhibited good collapse patterns common to previous data indicative of both proper tensioning levels and reverse air flow distribution.

All seven bags yielded nominal retained levels in all physical properties of strength and flex endurances. The current losses are all attributed to normal physical fatigue resulting from service use. There is no evidence of any chemical or thermal deterioration.

These specimens are rated at a general termination factor of 40% to 45% terminated.

Very often, fiberglass bags do not decline from equilibrium status in physical properties for several years of service however, once measurable fatigue is generated decline continues to termination. The bags are currently at a monthly 1.11% decline rate based on TLN 7774 data.

UNIT 1:

Again, all Unit 1 bags exhibited higher flow capacity throughput resulting from a more porous cake structure. Photo G is a microscopic view typical to all Unit 1 bags revealing the

generally porous non-agglomerated cake structure.

Again similar to TLN 7774 data, release properties under reverse air are generally good as shown by Photo H.

These bags (Unit 1) continue to have a lower sulphate salt extraction level with 2.81% by weight. It is apparent that Unit 1 has not experienced the moisture level of Unit 2 as Unit 1 sulphates are not in a state of agglomeration.

All Unit 1 specimens generated common declines in physical strength and flex properties resulting from nominal physical service use fatigue.

All bags are under generally good upward tensioning forces with no abnormal abrasion detected.

These bags are rated at a termination factor of 55% to 65%.

This data would reflect a monthly fatigue rate of 1.39% based on the TLN 7774 data.



Prepared for: INTERMOUNTAIN POWER

Date: 9-25-91

TLN : 9128

Page:

Identification: 1-A-1-G1

Fiber Content: ECDE

Fabric Construction: WOVEN

Weave: 3 X 1 TWILL

Count: 43 X 24

Yarn System- Warp/Length: 37-1/0F

Filling Width: 75-1/2T+75-1/0F

Avg. Weight [oz/sq yd]: 13.59 Thickness [inches]: .013 Density Factor: .807

Treatment- Physical Type: NONE

Chemical Type: A.R.

% Ignition Loss [LOI] ---> 500°F/1 Hr: 0.08% 1150°F/1 Hr: 4.12%

% Extractable Matter: SULPHATES

Acid Alkaline [PH]: 11.35

Fabrication

Seaming: CHAIN

Hardware: C.R.

Cuffing: LOCK

Sewing Thread: ECB

Ring Cover: LOCK

Fabrication Rating: GOOD

PROFILE DATA

TOP

CENTER

BOTTOM

Weight [oz/sq yd]	As Received	23.08	22.95	22.87
	Cleaned	17.01	16.78	16.54
	Cleaned (Washed)	13.62	13.56	13.57
Permeability	As received	2.11	2.15	2.29
CFM/sq ft	Cleaned	7.1	7.3	7.5
@ .5" H2O	Cleaned (Washed)	55.8	56.1	58.5
Breaking Strength lbs/inch	Warp/Length	387	395	382
	Filling/Width	223	227	221
Breaking Strength % Loss	Warp/Length	35.93%	34.60%	36.75%
	Filling/Width	36.10%	34.96%	36.68%
Mullen Burst (lbs/sq inch)		494	498	489
Mullen Burst % Loss		39.98%	39.49%	40.58%
Flex Cycles	Warp	21779	22027	21438
[MIT Method]	Fill	1704	1719	1695
Flex Cycles	Warp	56.44%	55.95%	57.12%
% Loss	Fill	53.92%	53.52%	54.16%
Other Testing				

IP12_006583



Prepared for: INTERMOUNTAIN POWER

Date: 9-25-91

TLN : 9128

Page:

Identification: 1-C-06-C12

Fiber Content: ECDE

Fabric Construction: WOVEN

Weave: 3 X 1 TWILL

Count: 44 X 24

Yarn System- Warp/Length: 37-1/0F

Filling Width: 75-1/2T+75-1/0F

Avg. Weight [oz/sq yd]: 13.74 Thickness [inches]: .014 Density Factor: .757

Treatment- Physical Type: NONE

Chemical Type: A.R.

% Ignition Loss [LOI] ---> 500°F/1 Hr: 0.21% 1150°F/1 Hr: 4.75%

% Extractable Matter: SULPHATES

Acid Alkaline [PH]: 11.40

Fabrication

Seaming: CHAIN

Hardware: C.R.

Cuffing: LOCK

Sewing Thread: ECB

Ring Cover: LOCK

Fabrication Rating: GOOD

PROFILE DATA

TOP

CENTER

BOTTOM

Weight [oz/sq yd]	As Received	23.25	23.15	23.11
	Cleaned	17.30	17.23	17.05
	Cleaned (Washed)	13.75	13.76	13.70
Permeability	As received	1.97	2.08	2.15
CFM/sq ft	Cleaned	7.0	7.1	7.4
@ .5" H2O	Cleaned (Washed)	43.5	43.7	42.5
Breaking Strength lbs/inch	Warp/Length	396	398	392
	Filling/Width	231	230	220
Breaking Strength % Loss	Warp/Length	34.44%	34.11%	35.10%
	Filling/Width	33.81%	34.20%	36.96%
Mullen Burst (lbs/sq inch)		499	512	501
Mullen Burst % Loss		39.37%	37.79%	39.13%
Flex Cycles	Warp	22381	23516	22282
[MIT Method]	Fill	1753	1742	1702
Flex Cycles	Warp	55.24%	52.97%	55.44%
% Loss	Fill	52.60%	52.89%	53.98%
Other Testing				

IP12_006584



Prepared for: INTERMOUNTAIN POWER

Date: 9-25-91

TLN : 9128

Page:

Identification: 1-A-7-J-20

Fiber Content: ECDE

Fabric Construction: WOVEN

Weave: 3 X 1 TWILL

Count: 44 X 24

Yarn System- Warp/Length: 37-1/0F

Filling Width: 75-1/2T+75-1/0F

Avg. Weight [oz/sq yd]: 13.79 Thickness [inches]: .015 Density Factor: .760

Treatment- Physical Type: NONE

Chemical Type: A.R.

% Ignition Loss [LOI] ---> 500°F/1 Hr: 0.24% 1150°F/1 Hr: 5.08%

% Extractable Matter: SULPHATES

Acid Alkaline [PH]: 11.40

Fabrication

Seaming: CHAIN

Hardware: C.R.

Cuffing: LOCK

Sewing Thread: ECB

Ring Cover: LOCK

Fabrication Rating: GOOD

PROFILE DATA

TOP

CENTER

BOTTOM

Weight [oz/sq yd]	As Received	23.39	23.31	23.20
	Cleaned	17.39	17.44	17.19
	Cleaned (Washed)	13.80	13.79	13.79
Permeability	As received	2.14	2.20	2.27
CFM/sq ft	Cleaned	7.1	7.1	7.3
@ .5" H2O	Cleaned (Washed)	43.5	42.4	42.8
Breaking Strength lbs/inch	Warp/Length	415	422	416
	Filling/Width	225	232	221
Breaking Strength % Loss	Warp/Length	31.29%	30.13%	31.13%
	Filling/Width	35.53%	33.52%	36.68%
Mullen Burst (lbs/sq inch)		511	514	511
Mullen Burst % Loss		37.91%	37.55%	37.91%
Flex Cycles	Warp	21886	21998	21526
[MIT Method]	Fill	1753	1801	1701
Flex Cycles	Warp	56.23%	56.00%	56.95%
% Loss	Fill	52.60%	51.30%	54.00%
Other Testing				

IP12_006585



Prepared for: INTERMOUNTAIN POWER

Date: 9-25-91

TLN : 9128

Page:

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Identification: 1-B-10-020

Fiber Content: ECDE

Fabric Construction: WOVEN

Weave: 3 X 1 TWILL

Count: 44 X 24

Yarn System- Warp/Length: 37-1/0F

Filling Width: 75-1/2T+75-1/0F

Avg. Weight [oz/sq yd]: 13.64 Thickness [inches]: .013 Density Factor: .810

Treatment- Physical Type: NONE

Chemical Type: A.R.

% Ignition Loss [LOI] ---> 500°F/1 Hr: 0.17% 1150°F/1 Hr: 4.56%

% Extractable Matter: SULPHATES

Acid Alkaline [PH]: 11.38

Fabrication

Seaming: CHAIN

Hardware: C.R.

Cuffing: LOCK

Sewing Thread: ECB

Ring Cover: LOCK

Fabrication Rating: GOOD

PROFILE DATA

TOP

CENTER

BOTTOM

Weight [oz/sq yd]	As Received	23.35	23.18	23.21
	Cleaned	17.17	17.19	17.25
	Cleaned (Washed)	13.63	13.62	13.68
Permeability	As received	2.09	2.15	2.18
CFM/sq ft	Cleaned	6.9	7.2	7.2
@ .5" H2O	Cleaned (Washed)	49.1	48.3	44.9
Breaking Strength lbs/inch	Warp/Length	420	427	419
	Filling/Width	223	224	220
Breaking Strength % Loss	Warp/Length	30.46%	29.31%	30.63%
	Filling/Width	36.10%	35.82%	36.96%
Mullen Burst (lbs/sq inch)		519	527	515
Mullen Burst % Loss		36.94%	35.97%	37.42%
Flex Cycles [MIT Method]	Warp	23496	24171	23215
	Fill	1795	1847	1812
Flex Cycles % Loss	Warp	53.01%	51.66%	53.57%
	Fill	51.46%	50.05%	51.00%
Other Testing				

IP12_006586



Prepared for: INTERMOUNTAIN POWER

Date: 9-25-91

TLN : 9128

Page:

Identification: 1-B-2-R-16

Fiber Content: ECDE

Fabric Construction: WOVEN

Weave: 3 X 1 TWILL

Count: 44 X 24

Yarn System- Warp/Length: 37-1/0F

Filling Width: 75-1/2T+75-1/0F

Avg. Weight [oz/sq yd]: 13.60 Thickness [inches]: .014 Density Factor: .750

Treatment- Physical Type: NONE

Chemical Type: A.R.

% Ignition Loss [LOI] ---> 500°F/1 Hr: 0.07% 1150°F/1 Hr: 4.08%

% Extractable Matter: SULPHATES

Acid Alkaline [PH]: 11.42

Fabrication

Seaming: CHAIN

Hardware: C.R.

Cuffing: LOCK

Sewing Thread: ECB

Ring Cover: LOCK

Fabrication Rating: GOOD

PROFILE DATA

TOP

CENTER

BOTTOM

Weight [oz/sq yd]	As Received	23.11	23.10	23.01
	Cleaned	17.23	17.09	16.94
	Cleaned (Washed)	13.61	13.57	13.62
Permeability	As received	2.11	2.18	2.30
CFM/sq ft	Cleaned	7.2	7.4	7.9
@ .5" H2O	Cleaned (Washed)	45.9	46.8	46.0
Breaking Strength lbs/inch	Warp/Length	401	402	379
	Filling/Width	221	228	219
Breaking Strength % Loss	Warp/Length	33.61%	33.44%	37.25%
	Filling/Width	36.68%	34.67%	37.25%
Mullen Burst (lbs/sq inch)		509	510	497
Mullen Burst % Loss		38.15%	38.03%	39.61%
Flex Cycles [MIT Method]	Warp	21419	21593	21174
	Fill	1689	1695	1652
Flex Cycles % Loss	Warp	57.16%	56.81%	57.65%
	Fill	54.33%	54.16%	55.33%
Other Testing				

IP12_006587



Prepared for: INTERMOUNTAIN POWER

Date: 9-25-91

TLN : 9128

Page:

Identification: 2-A-2-G-1

Fiber Content: ECDE

Fabric Construction: WOVEN

Weave: 3 X 1 TWILL

Count: 44 X 24

Yarn System- Warp/Length: 37-1/0F

Filling Width: 75-1/2T+75-1/0F

Avg. Weight [oz/sq yd]: 13.70 Thickness [inches]: .014 Density Factor: .750

Treatment- Physical Type: NONE

Chemical Type: A.R.

% Ignition Loss [LOI] ---> 500°F/1 Hr: 0.17% 1150°F/1 Hr: 4.29%

% Extractable Matter: SULPHATES

Acid Alkaline [PH]: 11.40

Fabrication

Seaming: CHAIN

Hardware: C.R.

Cuffing: LOCK

Sewing Thread: ECB

Ring Cover: LOCK

Fabrication Rating: GOOD

PROFILE DATA

TOP

CENTER

BOTTOM

Weight [oz/sq yd]	As Received	24.51	24.30	24.29
	Cleaned	18.15	18.08	17.94
	Cleaned (Washed)	13.68	13.72	13.71
Permeability	As received	1.81	2.01	2.05
CFM/sq ft	Cleaned	6.8	6.9	7.1
@ .5" H2O	Cleaned (Washed)	48.5	47.1	47.8
Breaking Strength lbs/inch	Warp/Length	466	470	467
	Filling/Width	270	273	268
Breaking Strength % Loss	Warp/Length	22.85%	22.19%	22.68%
	Filling/Width	22.64%	21.78%	23.21%
Mullen Burst (lbs/sq inch)		558	563	554
Mullen Burst % Loss		32.20%	31.59%	32.69%
Flex Cycles	Warp	25712	25808	25507
[MIT Method]	Fill	1830	1826	1804
Flex Cycles	Warp	48.58%	48.38%	48.99%
% Loss	Fill	50.57%	50.62%	51.24%
Other Testing				

IP12_006588



Prepared for: INTERMOUNTAIN POWER

Date: 9-25-91

TLN : 9128

Page:

Identification: 2-B-2-J-11

Fiber Content: ECDE

Fabric Construction: WOVEN

Weave: 3 X 1 TWILL

Count: 43 X 24

Yarn System- Warp/Length: 37-1/0F

Filling Width: 75-1/2T+75-1/0F

Avg. Weight [oz/sq yd]: 13.68 Thickness [inches]: .013 Density Factor: .754

Treatment- Physical Type: NONE

Chemical Type: A.R.

% Ignition Loss [LOI] ---> 500°F/1 Hr: 0.24% 1150°F/1 Hr: 4.64%

% Extractable Matter: SULPHATES

Acid Alkaline [PH]: 11.47

Fabrication

Seaming: CHAIN

Hardware: C.R.

Cuffing: LOCK

Sewing Thread: ECB

Ring Cover: LOCK

Fabrication Rating: GOOD

PROFILE DATA

TOP

CENTER

BOTTOM

As Received

22.89

23.01

23.06

Weight [oz/sq yd]

Cleaned

17.01

16.87

17.12

Cleaned (Washed)

13.69

31.70

13.65

Permeability

As received

2.35

2.31

2.29

CFM/sq ft

Cleaned

7.6

7.9

7.4

@ .5" H2O

Cleaned (Washed)

51.6

51.4

54.7

Breaking
Strength
lbs/inch

Warp/Length

471

472

468

Filling/Width

271

273

264

Breaking
Strength
% Loss

Warp/Length

22.02%

21.85%

22.52%

Filling/Width

22.41%

21.78%

24.36%

Mullen Burst (lbs/sq inch)

550

561

542

Mullen Burst % Loss

33.09%

31.75%

34.06%

Flex Cycles

Warp

25605

25463

25051

[MIT Method]

Fill

1883

1905

1871

Flex Cycles

Warp

48.79%

49.07%

49.90%

% Loss

Fill

49.08%

48.49%

49.41%

Other Testing

IP12_006589



Prepared for: INTERMOUNTAIN POWER

Date: 9-25-91

TLN : 9128

Page:

Identification: 2-B-4-020

Fiber Content: ECDE

Fabric Construction: WOVEN

Weave: 3 X 1 TWILL

Count: 44 X 24

Yarn System- Warp/Length: 37-1/0F

Filling Width: 75-1/2T+75-1/0F

Avg. Weight [oz/sq yd]: 13.80 Thickness [inches]: .014 Density Factor: .754

Treatment- Physical Type: NONE

Chemical Type: A.R.

% Ignition Loss [LOI] ---> 500°F/1 Hr: 0.19% 1150°F/1 Hr: 4.89%

% Extractable Matter: SULPHATES

Acid Alkaline [PH]: 11.41

Fabrication

Seaming: CHAIN

Hardware: C.R.

Cuffing: LOCK

Sewing Thread: ECB

Ring Cover: LOCK

Fabrication Rating: GOOD

PROFILE DATA

TOP

CENTER

BOTTOM

Weight [oz/sq yd]	As Received	24.38	24.26	24.14
	Cleaned	18.09	18.02	17.90
	Cleaned (Washed)	13.78	13.81	13.82
Permeability CFM/sq ft @ .5" H2O	As received	1.49	1.91	2.11
	Cleaned	6.7	6.9	7.1
	Cleaned (Washed)	45.2	44.7	45.1
Breaking Strength lbs/inch	Warp/Length	475	481	470
	Filling/Width	275	289	272
Breaking Strength % Loss	Warp/Length	21.36%	20.36%	22.19%
	Filling/Width	21.20%	17.19%	22.06%
Mullen Burst (lbs/sq inch)		561	563	559
Mullen Burst % Loss		31.845	31.59%	32.08%
Flex Cycles [MIT Method]	Warp	25991	26136	25643
	Fill	1903	1928	1869
Flex Cycles % Loss	Warp	48.02%	47.73%	48.71%
	Fill	48.54%	47.86%	49.46%
Other Testing				

IP12_006590



Prepared for: INTERMOUNTAIN POWER

Date: 9-25-91

TLN : 9128

Page:

Identification: 2-C-6-I12 Fiber Content: ECDE

Fabric Construction: WOVEN Weave: 3 X 1 TWILL Count: 44 X 24

Yarn System- Warp/Length: 37-1/0F Filling Width: 75-1/2T+75-1/0F

Avg. Weight [oz/sq yd]: 13.65 Thickness [inches]: .014 Density Factor: .752

Treatment- Physical Type: NONE Chemical Type: A.R.

% Ignition Loss [LOI] ---> 500°F/1 Hr: 0.14% 1150°F/1 Hr: 4.42%

% Extractable Matter: SULPHATES Acid Alkaline [PH]: 11.38

Fabrication Seaming: CHAIN Hardware: C.R.
Cuffing: LOCK Sewing Thread: ECB
Ring Cover: LOCK Fabrication Rating: GOOD

PROFILE DATA		TOP	CENTER	BOTTOM
Weight [oz/sq yd]	As Received	24.30	24.01	24.01
	Cleaned	17.99	17.79	17.64
	Cleaned (Washed)	13.64	13.66	13.64
Permeability CFM/sq ft @ .5" H2O	As received	1.64	1.93	2.03
	Cleaned	6.7	6.9	7.0
	Cleaned (Washed)	52.5	50.8	51.3
Breaking Strength lbs/inch	Warp/Length	479	478	475
	Filling/Width	283	290	281
Breaking Strength % Loss	Warp/Length	20.70%	20.86%	21.36%
	Filling/Width	18.91%	16.91%	19.48%
Mullen Burst (lbs/sq inch)		564	569	564
Mullen Burst % Loss		31.47%	30.86%	31.47%
Flex Cycles [MIT Method]	Warp	28815	29163	28146
	Fill	2108	2140	2079
Flex Cycles % Loss	Warp	42.37%	41.67%	43.71%
	Fill	42.99%	42.14%	43.78%
Other Testing				

IP12_006591



Prepared for: INTERMOUNTAIN POWER

Date: 9-25-91

TLN : 9128

Page:

Identification: 2-B-2-M13 Fiber Content: ECDE
Fabric Construction: WOVEN Weave: 3 X 1 TWILL Count: 44 X 24
Yarn System- Warp/Length: 37-1/0F Filling Width: 75-1/2T+75-1/0F
Avg. Weight [oz/sq yd]: 13.73 Thickness [inches]: .013 Density Factor: .752
Treatment- Physical Type: NONE Chemical Type: A.R.
% Ignition Loss [LOI] ---> 500°F/1 Hr: 0.17% 1150°F/1 Hr: 4.29%
% Extractable Matter: SULPHATES Acid Alkaline [PH]: 11.39
Fabrication Seaming: CHAIN Hardware: C.R.
Cuffing: LOCK Sewing Thread: ECB
Ring Cover: LOCK Fabrication Rating: GOOD

PROFILE DATA		TOP	CENTER	BOTTOM
Weight [oz/sq yd]	As Received	24.26	24.19	23.80
	Cleaned	17.88	17.79	17.71
	Cleaned (Washed)	13.75	13.72	13.71
Permeability	As received	1.35	1.98	2.07
CFM/sq ft	Cleaned	6.9	7.0	7.0
@ .5" H2O	Cleaned (Washed)	48.7	49.1	49.2
Breaking Strength lbs/inch	Warp/Length	470	474	469
	Filling/Width	268	271	265
Breaking Strength % Loss	Warp/Length	22.19%	21.52%	22.35%
	Filling/Width	23.21%	22.41%	24.07%
Mullen Burst (lbs/sq inch)		554	555	549
Mullen Burst % Loss		32.69%	32.56%	33.29%
Flex Cycles	Warp	25742	25815	25416
[MIT Method]	Fill	1879	1894	1876
Flex Cycles	Warp	48.52%	48.37%	49.17%
% Loss	Fill	49.19%	48.78%	49.27%
Other Testing				

IP12_006592



Prepared for: INTERMOUNTAIN POWER

Date: 9-25-91

TLN : 9128

Page:

Identification: 2-B-4-P18 Fiber Content: ECDE
Fabric Construction: WOVEN Weave: 3 X 1 TWILL Count: 43 X 24
Yarn System- Warp/Length: 37-1/0F Filling Width: 75-1/2T+75-1/0F
Avg. Weight [oz/sq yd]: 13.59 Thickness [inches]: .013 Density Factor: .807
Treatment- Physical Type: NONE Chemical Type: A.R.
% Ignition Loss [LOI] ---> 500°F/1 Hr: 0.09% 1150°F/1 Hr: 4.15%
% Extractable Matter: SULPHATES Acid Alkaline [PH]: 11.41
Fabrication Seaming: CHAIN Hardware: C.R.
Cuffing: LOCK Sewing Thread: ECB
Ring Cover: LOCK Fabrication Rating: GOOD

PROFILE DATA		TOP	CENTER	BOTTOM
Weight [oz/sq yd]	As Received	24.21	24.05	23.98
	Cleaned	17.97	17.82	17.80
	Cleaned (Washed)	13.60	13.60	13.57
Permeability CFM/sq ft @ .5" H2O	As received	1.68	2.08	2.09
	Cleaned	6.9	7.1	7.0
	Cleaned (Washed)	55.0	54.5	54.8
Breaking Strength lbs/inch	Warp/Length	464	468	460
	Filling/Width	267	267	262
Breaking Strength % Loss	Warp/Length	23.18%	22.52%	23.84%
	Filling/Width	23.50%	23.50%	24.93%
Mullen Burst (lbs/sq inch)		550	551	548
Mullen Burst % Loss		33.17%	33.05%	33.41%
Flex Cycles [MIT Method]	Warp	25536	25708	25429
	Fill	1876	1900	1817
Flex Cycles % Loss	Warp	48.93%	48.58%	49.14%
	Fill	49.27%	48.62%	50.87%
Other Testing				

IP12_006593



Prepared for: INTERMOUNTAIN POWER

Date: 9-25-91

TLN : 9128

Page:

Identification: 2-A-101-E-1

Fiber Content: ECDE

Fabric Construction: WOVEN

Weave: 3 X 1 TWILL

Count: 44 X 24

Yarn System- Warp/Length: 37-1/0F

Filling Width: 75-1/2T+75-1/0F

Avg. Weight [oz/sq yd]: 13.68 Thickness [inches]: .013 Density Factor: .812

Treatment- Physical Type: NONE

Chemical Type: A.R.

% Ignition Loss [LOI] ---> 500°F/1 Hr: 0.09% 1150°F/1 Hr: 4.62%

% Extractable Matter: SULPHATES

Acid Alkaline [PH]: 11.41

Fabrication

Seaming: CHAIN

Hardware: C.R.

Cuffing: LOCK

Sewing Thread: ECB

Ring Cover: LOCK

Fabrication Rating: GOOD

PROFILE DATA

TOP

CENTER

BOTTOM

Weight [oz/sq yd]	As Received	24.39	24.21	24.12
	Cleaned	18.01	17.95	17.84
	Cleaned (Washed)	13.67	13.68	13.68
Permeability	As received	1.90	1.94	2.05
CFM/sq ft	Cleaned	7.0	7.0	7.2
@ .5" H2O	Cleaned (Washed)	43.5	44.1	43.4
Breaking Strength lbs/inch	Warp/Length	473	480	471
	Filling/Width	265	265	263
Breaking Strength % Loss	Warp/Length	21.69%	20.53%	22.02%
	Filling/Width	24.07%	24.07%	24.64%
Mullen Burst (lbs/sq inch)		561	568	557
Mullen Burst % Loss		31.84%	30.98%	32.32%
Flex Cycles	Warp	25843	26100	25549
[MIT Method]	Fill	1905	1921	1847
Flex Cycles	Warp	48.31%	47.80%	48.90%
% Loss	Fill	48.49%	48.05%	50.05%
Other Testing				

IP12_006594

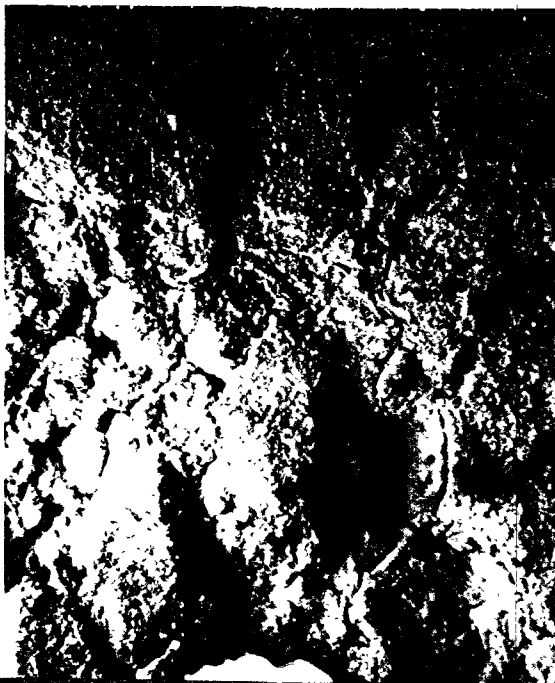


PHOTO A - UNIT 2-B-2 - HIGH
AGGLOMERATES

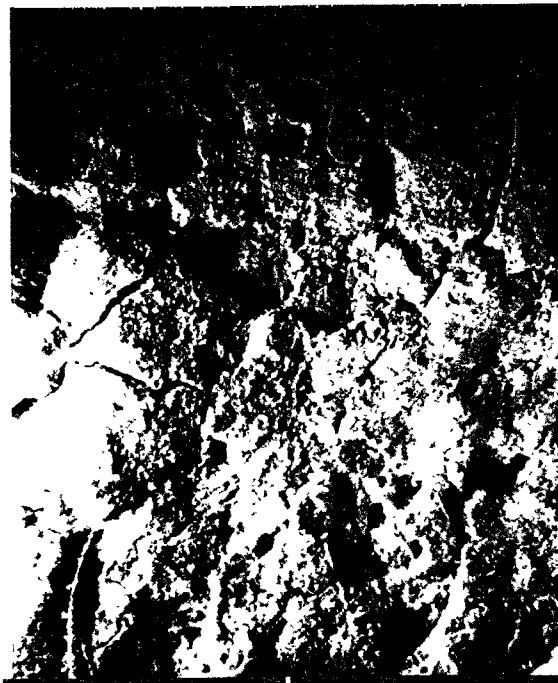


PHOTO B - RETAINED NODULAS

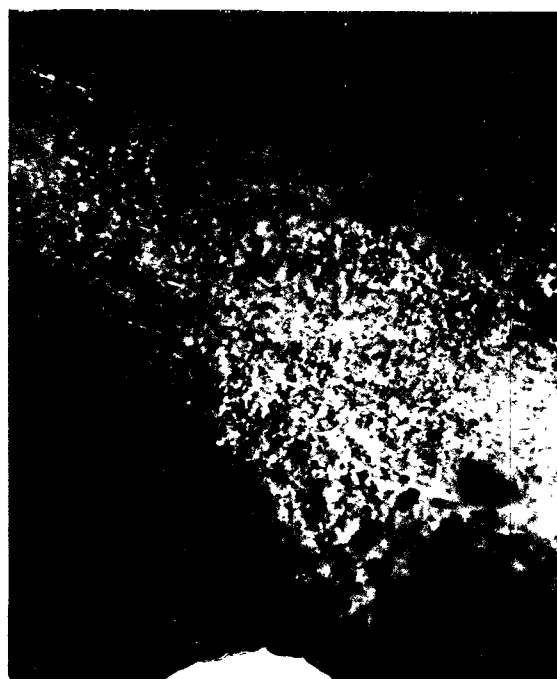


PHOTO C - HIGH EMBEDDED DUST

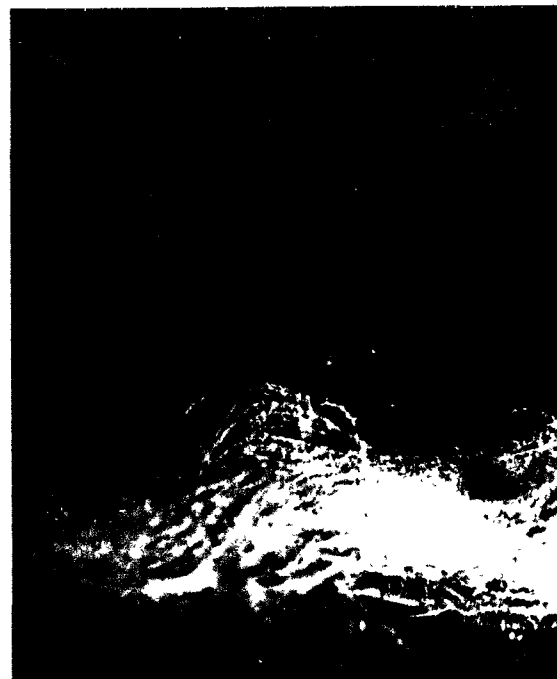


PHOTO D - LOWER EMBEDDED DUST



PHOTO E - FIBER ENCAPSULATION

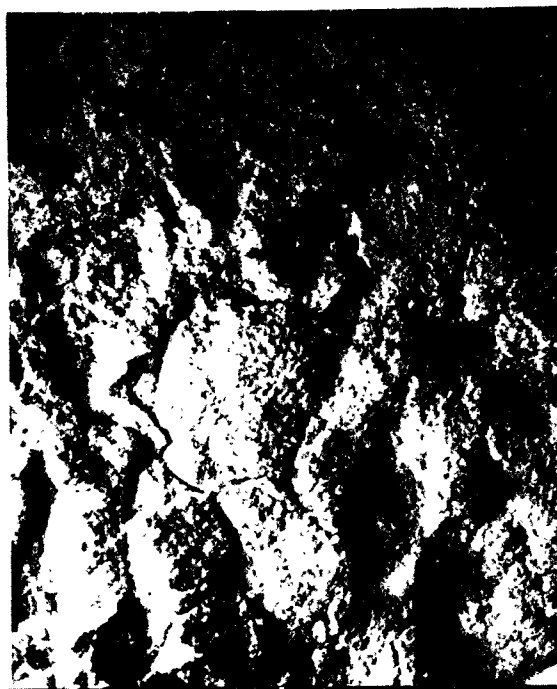


PHOTO F - AGGLOMERATE CAKE STRUCTURE

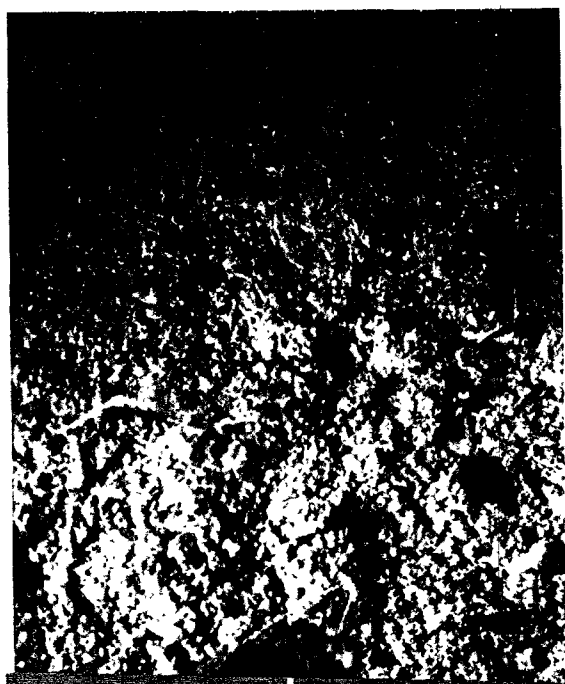


PHOTO G - POROUS FILTER CAKE

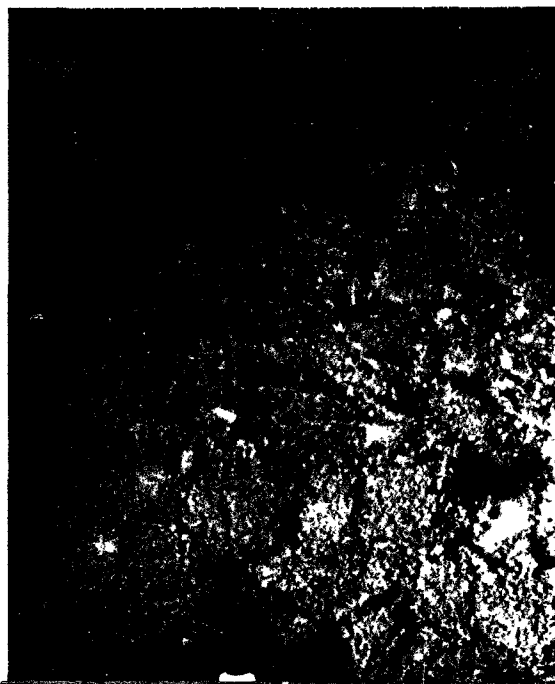


PHOTO H - NOMINAL RELEASE